
Chapter 3B- The Molecules of Cell Macromolecules

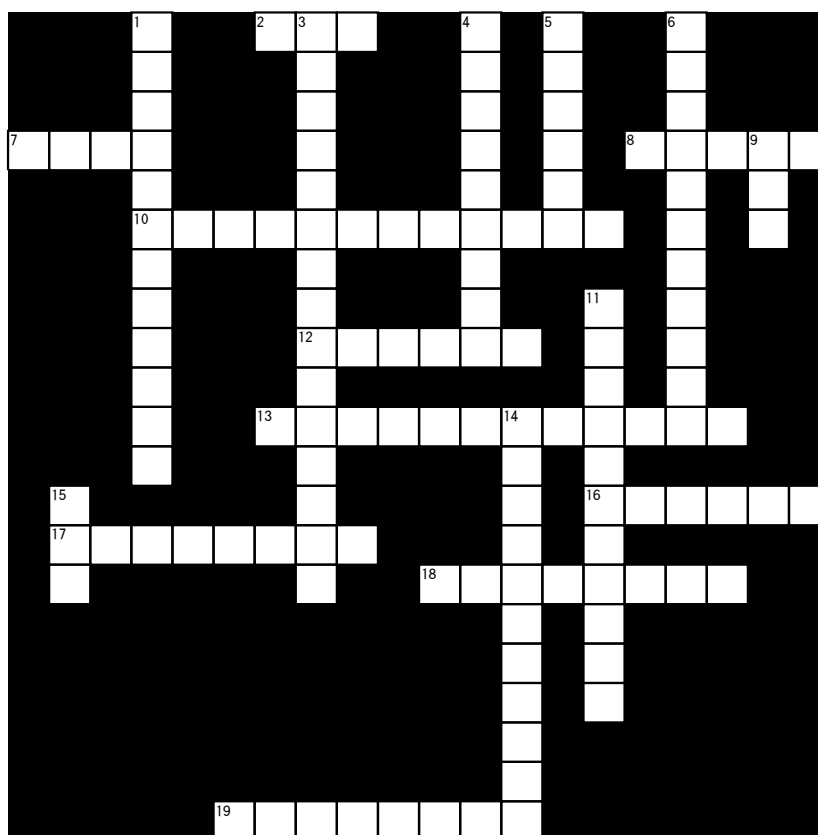
Directions: There are four main classes of macromolecules. Most are polymers, assembled from smaller monomers in a process called a dehydration reaction. Hydrolysis breaks polymers back down to monomers. State whether each of the following relates to dehydration (D) or hydrolysis (H).

- _____ 1. Connects monomers to form a polymer.
- _____ 2. Produces water as a by-product.
- _____ 3. Breaks up polymers, forming monomers.
- _____ 4. Water is used to break bonds between monomers.
- _____ 5. Joins amino acids to form a protein.
- _____ 6. Glycerol and fatty acids combine this way to form a fat.
- _____ 7. Occurs when polysaccharides are digested to form monosaccharides.
- _____ 8. —H and —OH groups form water.
- _____ 9. Nucleic acid breaks up to form nucleotides.
- _____ 10. Water breaks up, forming —H and —OH groups on separate monomers.

Directions: Select the answer that best completes the question or statement below. Place your answer in the blank space.

- _____ 11. In a hydrolysis reaction _____, and in this process water is _____.
 - a. a polymer breaks up to form monomers . . . consumed
 - b. a monomer breaks up to form polymers . . . produced
 - c. monomers are assembled to produce a polymer . . . consumed
 - d. monomers are assembled to produce a polymer . . . produced
 - e. a polymer breaks up to form monomers . . . produced
- _____ 12. The four main categories of macromolecules in a cell are
 - a. proteins, DNA, RNA, and steroids
 - b. monosaccharides, lipids, polysaccharides, and proteins
 - c. proteins, nucleic acids, carbohydrates, and lipids
 - d. nucleic acids, carbohydrates, monosaccharides, and proteins
 - e. RNA, DNA, proteins, and carbohydrates

Directions: Review the structures and functions of lipids by completing the following crossword puzzle.



Across

- 2 A _____ forms a waterproof coat that keeps a fruit or insect from drying out.
- 7 Oil and corn _____ are examples of unsaturated fats.
- 8 Glycerol and three _____ acids make a triglyceride.
- 10 _____ means that hydrogen has been added to unsaturated fats.
- 12 _____ are grouped together because they do not mix well with water.
- 13 _____ is another name for "fat."
- 16 _____ is a lipid-containing deposit in a blood vessel.
- 17 _____ steroids are dangerous synthetic variants of testosterone.
- 18 Female and male sex hormones are examples of _____.
- 19 A fat molecule is composed of _____ and three fatty acids

Down

- 1 A _____ is similar to fat; found in cell membranes.
- 3 _____ is a condition where lipid-containing deposits build up in blood vessels.
- 4 Animal fats are said to be _____.
- 5 Unsaturated fats contain more _____ bonds than saturated fats.
- 6 Fats with double bonds are said to be _____.
- 9 _____ is an illegal steroid recently banned by the Olympic Committee, FDA, and professional sports.
- 11 Lipids are water-avoiding, or _____ substances.
- 14 _____ is a steroid common in cell membranes.
- 15 A _____ is a large molecule whose main function is energy storage.

Directions: Everything a cell does involves proteins. Eight functions of proteins are discussed in Module 3.11 (enzymes, transport proteins, etc.). Match each of the functional types with one of the descriptions below.

- _____ 13. Hemoglobin carries oxygen in the blood.
- _____ 14. A protein in muscle cells enables them to move.
- _____ 15. Antibodies fight disease-causing bacteria.
- _____ 16. Collagen gives bone strength and flexibility.
- _____ 17. Insulin signals cells to take in and use sugar.
- _____ 18. A protein in the cell receives the insulin signal.
- _____ 19. Proteins in seeds provide food for plant embryos.
- _____ 20. A protein called sucrase promotes the chemical conversion of sucrose into monosaccharides.

Directions: Nucleic acids are the fourth group of biological molecules discussed in this chapter. Review their structures and functions by matching each of the phrases on the left with a word or phrase from the list on the right. Answers may be used more than once.

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| _____ 21. Sugar in RNA | A. Phosphate group |
| _____ 22. Overall structure of DNA | B. Deoxyribose |
| _____ 23. Short for “ribonucleic acid” | C. A, T, C, G |
| _____ 24. Molecule passed on from parent to offspring | D. DNA |
| _____ 25. Nitrogenous bases of RNA | E. Nucleotide |
| _____ 26. The stuff that genes are made of | F. A, U, C, G |
| _____ 27. Nitrogenous bases of DNA | G. Double helix |
| _____ 28. Programs the amino acid sequence of a polypeptide | H. Ribose |
| _____ 29. DNA works through this intermediary | I. Nitrogenous base |
| _____ 30. A nucleotide consists of sugar, phosphate, and this | J. RNA |
| _____ 31. Sugar of one nucleotide bonds to this in next nucleotide | K. Gene |
| _____ 32. Monomer of nucleic acids | |
| _____ 33. Sugar DNA | |
| _____ 34. A mutation in this results in lactose intolerance | |

Directions: Answer the following question using complete sentences.

Fred suffers from a disease that makes it difficult for his cells to produce glycogen. For him, three meals a day are not enough; he needs to snack constantly. Explain why.

[illegible]